2.0 DESCRIPTION OF PROPOSED PROJECT

This section addresses Project history and describes details of the proposed Project, including current conditions, proposed construction activities, safety controls, and operational conditions. Section 2.1 presents Project site history and an overview of existing PRC 421 structures and other facilities associated with oil production in the Ellwood area, which generally encompasses offshore and coastal areas between the Bacara Resort and Coal Oil Point, including an onshore area that extends almost to Hollister Avenue. Section 2.2 describes the proposed Project (recommissioning PRC 421); Section 2.3 describes construction activities associated with the Project; and Section 2.4 addresses proposed operation, maintenance, and safety controls.

2.1 PROJECT BACKGROUND

2.1.1 Project History

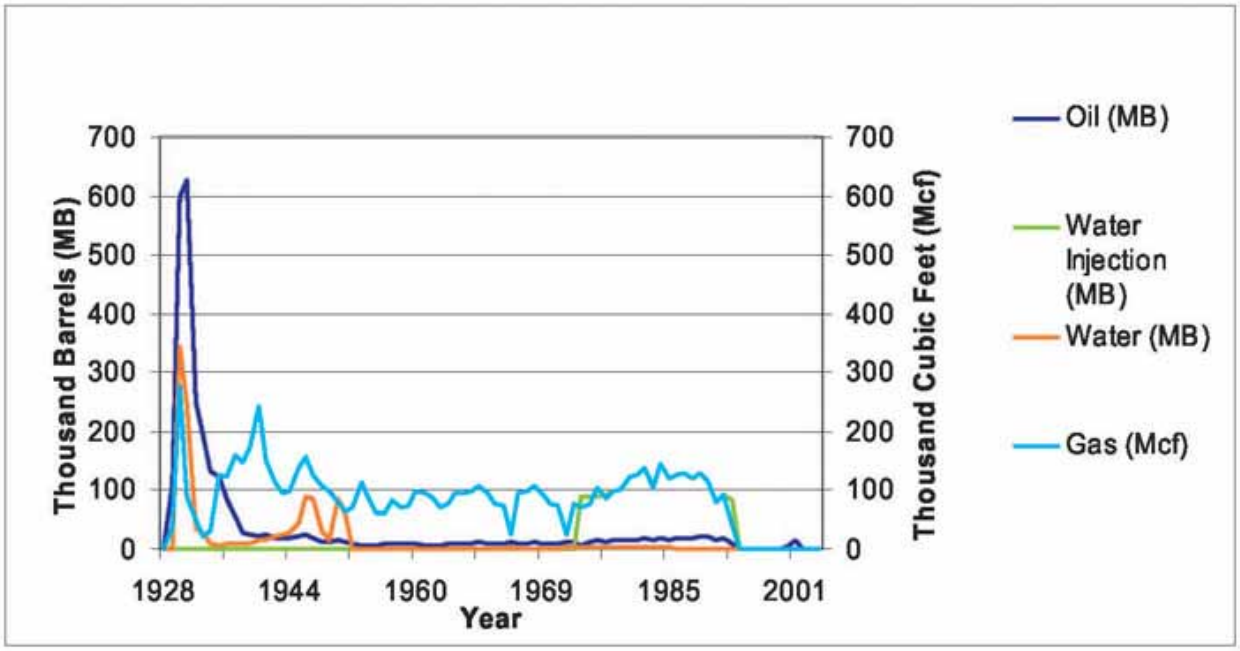
PRC 421 Lease History

The two existing PRC 421 piers, Pier 421-1 and Pier 421-2, are the last remaining production structures associated with the prolific oil development of the Ellwood Oil Field that occurred along the Ellwood Coast from the 1930s to 1950s. Ellwood Field is an oil reservoir that was discovered by Barnsdall Oil Company in July 1928. The reservoir is approximately 4 miles long and 0.5 miles wide, trending east-west along the shoreline just south of the Sandpiper Golf Course. The immediate Project vicinity supported numerous onshore and offshore wells from the 1930s through the 1950s, along with substantial supporting infrastructure. Peak production from the Ellwood Field reached nearly 49,000 barrels[1] of oil per day (BOPD) in 1930. Remnants of this infrastructure still exist today, including multiple capped wells, the old timber seawall which lines portions of the Ellwood Coast, and the surf zone production piers of PRC 421.

A total of nine wells were drilled within PRC 421 (California State Lands Commission [CSLC] 2006b). The existing piers associated with PRC 421 were constructed in 1928 and production peaked from the associated wells in 1931, at nearly 628,000 barrels of oil (Figure 2-1). By the mid-1950s, more than half of the offshore wells in the Ellwood Field were plugged and abandoned. On PRC 421, all but two wells were plugged and abandoned. The two wells that remained were 421-2, a producer, and 421-1, which was converted to injection of produced water in 1973. By the end of 1993, Well 421-2

[1] 1 barrel is equivalent in volume to 42 gallons

FIGURE 2-1. PRODUCTION HISTORY OF PRC 421



became the only producing well in the Ellwood Field. Mobil Exploration and Producing, Inc. (Mobil) was the lessee at this time, having acquired the lease from ARCO. In 1997, Mobil sold the lease and the Ellwood facilities, including the piers, Ellwood Marine Terminal (EMT), Ellwood Onshore Facility (EOF), and Platform Holly to Venoco, Inc. (Venoco), a privately held, independent oil and gas company (CSLC 2006b).

PRC 421 Production History

The Ellwood Field produces "sweet oil,"[1] which is low in sulfur and carbon dioxide and requires less refining in order to meet product specifications. The gravity of the oil from Well 421-2 is 35° American Petroleum Institute (API), which is indicative of the light, "sweet" nature of the oil produced from the Ellwood Field, compared to the heavier oil typically found in the South Ellwood Field located further offshore, which requires processing to remove sulfur and other impurities. Figure 2-1 provides a summary of the production from the PRC 421 wells.

Recent production information is only available for Well 421-2 because Well 421-1 has not produced oil since 1972. During the latest five consecutive years of operation (1989 to 1993), Well 421-2 produced an average of 17,200 barrels of oil per year.

[1] Petroleum is considered "sweet" if it contains less than 0.5% sulfur

PRC 421 Spill and Repair History

In 1994, PRC 421 was shut-in when the 6-inch pipeline extending from the lease to Line 96 leaked, resulting in a release of approximately 170 barrels of oil underneath the 12th green at the Sandpiper Golf Course, near the coastal bluffs. Mobil obtained an Emergency Permit (94-EMP-002) and a Final Development Plan (94-FDP-009) for clean up and repair of the pipeline. Oiled soil was excavated and the area cleaned up as part of the subsequent pipeline repair project.

Subsequently, in November 2000, during routine Santa Barbara County Air Pollution Control District (APCD) inspections, a methane gas leak was detected at Well 421-1 and Well 421-2 experienced an oil leak induced by a fluid level check. Subsequent inspection noted the corroded condition of the well control and associated equipment occupying the piers and the potential for a release to the adjacent marine environment. Santa Barbara County approved specific corrective actions in an emergency permit on November 28, 2000. Revisions to the 2000 emergency permit authorized a series of major improvements and repairs in 2001 to stabilize both wells on PRC 421. The condition of the access road, piers, wells, and production equipment had deteriorated and Venoco initiated major repairs. The access road was resurfaced to permit heavy equipment access, riprap was installed to reinforce the old timber bulkhead seawall, and the piers supporting the two caissons were repaired and reinforced. Other activities included repairing the caissons, casings, and wellheads, installing subsurface safety valves in the wells, and removing all production equipment from the piers. During this period, a temporary flowline was extended from the EOF to Well 421-2 under the emergency permit to relieve wellhead pressure. The depressurization of Well 421-2 resulted in the production of approximately 17,000 barrels of oil during the ten months it flowed. Following the well stabilization project, the wells were re-idled. The environmental impacts of the repair project were assessed in the 2001 Negative Declaration (ND) (01-ND-34) and the work was authorized under an emergency permit (00-EMP-006) and subsequent revisions (RV01-03) issued by the Santa Barbara County.

On January 19, 2004, following a series of severe winter storms, a large section of the outer caisson wall of Pier 421-1 sheared off and fell into the surf below. In response to a CSLC directive and to protect the caisson from further deterioration, Venoco installed a new wall face on the ocean (south) side of the caisson with a small return on the adjacent east and west facing walls. Venoco also removed the fallen wall debris from the beach. Construction of the new wall was completed on December 22, 2004. Emergency permits were granted by the city of Goleta (04-EMP-001), the U.S. Army Corps of Engineers

(USACE) (200401576-JCM), and the California Coastal Commission (CCC) (E-01-013-G) and the environmental impacts of this activity were assessed in the 2006 ND (06-MND-01). A follow-up permit (05-132-DP) was granted by the city of Goleta in October, 2006.

Reservoir Repressurization

In 2001, it was determined that the Vaqueros Reservoir, which is the source of oil for production from PRC 421, had become repressurized. The repressurization of the reservoir was identified when Venoco installed a temporary pipeline at Well 421-2 in response to the detection of minor leaks in both wellheads. When Well 421-2 was opened in 2000, it flowed a total of 17,000 barrels of nearly pure oil over the next 10 months. The fact that Well 421-2 flowed after being shut-in for six years suggested the Vaqueros Reservoir had repressurized. In addition to the 2000 leakage incident and subsequent flowing of 421-2, other evidence shows that pressure in the Vaqueros reservoir has been rising for many years, even prior to the 1994 shut-in of 421-2. Fluid level data from 421-2 from late 1987 through 2001 shows a steadily increasing bottomhole pressure (CSLC, 2006b). The repressurization is thought to be caused by either natural aquifer influx or from injection into Well WD-1, a well that was drilled at the EOF in 1973 in order to dispose of produced water from Platform Holly.

The repressurization of the Ellwood Field is a concern because a number of offshore wells in the area may not have been properly plugged and abandoned in the 1930s, 1940s, and 1950s. According to a review conducted by the CSLC's Minerals Resources Management Division in 2001, at least 20 of the 72 wells drilled into the Vaqueros Reservoir from offshore piers had potential deficiencies in their abandonment procedures, specifically from concrete plugs being installed to a depth of 5 feet when current standards require a minimum plug thickness of 30 feet. There is a concern as to whether the older abandoned wells might leak, or if they might require re-abandonment.

Injection Well WD-1

Well WD-1 is drilled into a down-structure portion of the Vaqueros Reservoir. The Well is located at the EOF, about 2,500 ft northwest of PRC 421. The location was chosen partly because the Vaqueros in that area is thought to be isolated from the oil-bearing part of the Vaqueros (the Ellwood Field) by an east-west trending, high-angle reverse fault. Geologic data and cumulative production and injection data suggest WD-1 is not the cause of repressurization in the Vaqueros Reservoir, and that WD-1 and the wells on PRC 421 penetrate separate fault blocks that are not connected. Exploratory and developmental drilling in the Ellwood Field revealed a subsurface geologic structure that includes the east-west trending La Vigia fault. Drilling showed the fault to be a trapping

mechanism for oil accumulation in the Vaqueros sand on the northern flank of the eastern high, as there was no oil found in the Vaqueros sand north of the fault (CSLC 2006b).

Further, an examination of cumulative production and injection data for the Ellwood Field suggests that injection volumes into WD-1 were insufficient to cause an increase in pressure throughout the Vaqueros, even if they were connected. Ignoring gas, there is a net void of nearly 155 million barrels for the Ellwood Field. In a closed system, this would result in a decrease in reservoir pressure. Therefore, it seems unlikely that injection into Well WD-1 is responsible for the pressure increase evidenced in Well 421-2 (CSLC 2006b).

Aquifer Influx

Several lines of evidence suggest that aquifer influx (natural water drive) is the cause of repressurization in the Vaqueros Reservoir of the Ellwood Field. First, geologic data from exploratory and developmental drilling showed that oil accumulation lies atop an extensive aquifer. Second, an active water drive was suspected early in the field's development, as most initial wells flowed, and many experienced rapid water encroachment. Finally, evidence of pressure support from aquifer influx, as well as gravity segregation, can be seen in the production performance of Well 421-2 (CSLC 2006b).

Well 421-2, after flowing initially at more than 1,000 BOPD, experienced a steep decline from 1930 to 1940. The water flow rate increased steadily during that time; however, between the early 1940s to mid 1960s, its oil production rate held steady at 20 to 30 BOPD, with about 90 percent water cut. Then the oil rate increased, gradually but steadily, to nearly 60 BOPD in 2000. The increase began more than a decade prior to commencement of injection into WD-1. In fact, the production performance of Well 421-2 seems completely unaffected by the onset of injection in WD-1. Instead, the gradual increase in oil rate in Well 421-2 appears to be the result of the well's position at the crest of the structure, the elimination of competing wells in the field, and the combined effect of both natural aquifer influx and produced water re-injection into nearby Well 421-1. By the mid-1960s and extending into the early-1970s, most producing wells in the eastern part of the field were plugged and abandoned due to production levels that were not economically viable. At the same time, injection into the reservoir was initiated for the first time. From the 1930s through the 1960s, most produced water from the Ellwood Field was disposed of in the ocean. Well 421-1 was converted from a producer to an injector in the early 1970s, and it appears to have increased the oil rate in Well

421-2 by at least 10 BOPD. Thus, natural aquifer influx and gravity segregation seems to have caused both the repressurization in the crestal portion of the Vaqueros Reservoir and the improvement of the oil production rate from Well 421-2 (CSLC 2006b).

Repressurization Monitoring

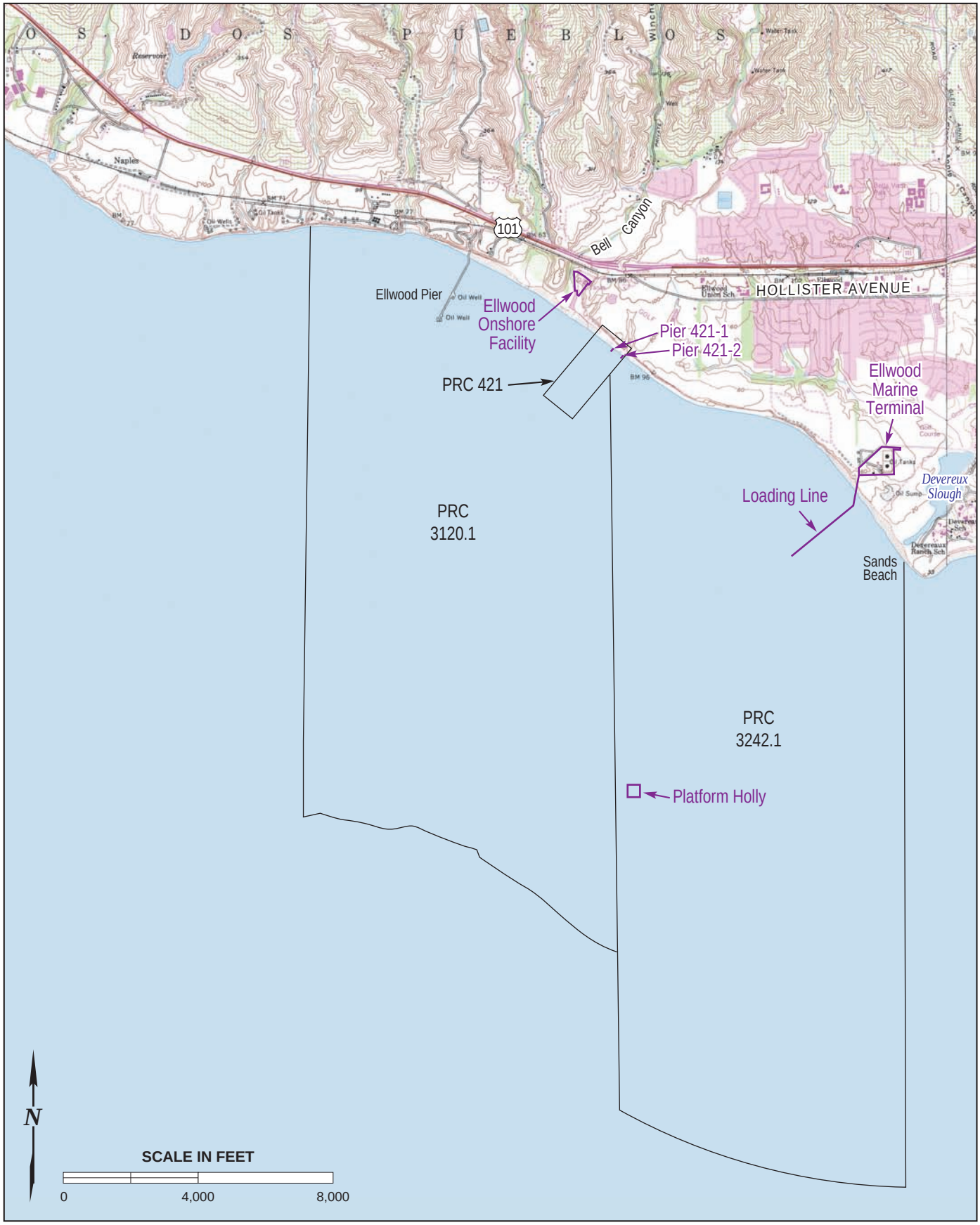
Pressure in the reservoir is not being monitored on a regular basis and no surveys or other monitoring of abandoned offshore has been conducted. A fall-off test on WD-1 was performed in December 4, 2002, which consisted of a 4-hour injection period, followed by a fall-off period of 37 hours. The purpose of the test was to confirm or refute the previously-held notion that the La Vigia fault was a barrier that isolated WD-1 from the wells on PRC 421. Although pressure data suggested some type of barrier was present, the duration of the test was inadequate to investigate the reservoir to the suspected distance of the La Vigia fault (CSLC 2006b).

2.1.2 CSLC Lease Boundary and Regulatory Boundary Areas

PRC 421, issued by the CSLC in 1949, is located in the surf zone of the Ellwood Coast, just south of Sandpiper Golf Course, southeast of the EOF, and 2,000 feet west of the Ellwood Mesa. The lease boundary is shown in Figure 2-2. The Bacara Resort lies approximately 3,700 feet to the west. The lease area is offshore of the city of Goleta, extending from the surf zone at the two well locations offshore to a water depth of about 50 feet Mean Lower Low Water (MLLW).

2.1.3 Existing Infrastructure at PRC 421

The primary facilities associated with PRC 421 occupy approximately 10,000 square feet of pier space and include two piers on State tide and submerged lands below the bluffs at the southern limit of Sandpiper Golf Course. An access road originating near Venoco's EOF provides access to the two shoreline piers at PRC 421. The access road extends from the EOF for 500 feet across Sandpiper Golf Course and then turns east and extends approximately 1,300 feet along the beach to the PRC 421 piers. An existing 6-inch pipeline connects PRC 421 to Line 96 (the oil line that connects the EOF to the EMT) at a tie-in located just outside of the EOF. Portions of the access road and the 6-inch pipeline are located within easements granted to Venoco by predecessors in the interest of the Sandpiper Golf Course and are located in the city of Goleta.



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Existing Lease Boundaries in Project Vicinity

FIGURE 2-2

The two piers, Pier 421-1 and Pier 421-2, are approximately 325 feet apart and provide access to support for two wells on separate concrete caissons, identified in the proposed Project as Well 421-1 (water and gas injection) and Well 421-2 (oil production). Each steel-pile caisson is a concrete and sheet pile, sand-filled structure, approximately 68 feet wide, 42 feet deep, and 20 feet above mean sea level (msl).

2.2 PROPOSED PROJECT

2.2.1 Project Action

The CSLC is considering approval of an application from Venoco to return oil and gas lease PRC 421 to production after ongoing production was shut-in in 1994. If granted, CSLC would allow Venoco to resume production of the oil and gas lease. Production would be expected to last approximately 12 years. Other agencies, including the city of Goleta, Santa Barbara County, the CCC, and others, also have permit authority over elements of the Project (see Section 1.4, Permits, Approvals and Regulatory Requirements).

2.2.2 Physical Description of Proposed Project

Resumption of production would require and entail:

- repairs to the caissons of Pier 421-2, similar to those already completed at Pier 421-1;
- return of Well 421-1 to service as a water and gas injection well;
- installation of a downhole electric submersible pump (ESP), stainless steel equipment enclosures, and new oil separation equipment on Pier 421-2;
- installation of a direct-buried power cable along the access road between PRC 421 and the EOF;
- installation of a communication system between PRC 421 and the EOF;
- installation of a surveillance camera mounted on Pier 421-2 that would monitor the piers and would provide live video feed displayed in the EOF Control Room;
- installation of a new double-walled flowline between Wells 421-2 and 421-1, and installation of two new 2-inch flowlines (one for water and gas, one for oil) inside the new double-walled flowline;
- upgrades to the existing 6-inch pipeline connecting PRC 421-1 to Line 96;

- installation of one new 2-inch oil flowline (inside the upgraded existing 6-inch pipeline) connecting PRC 421 to Line 96; and

- reactivation of the oil well on Pier 421-2, with a capacity to produce up to 700 BOPD of crude oil.

Based on current projections, Venoco has estimated the productive life of PRC 421 would be approximately 12 years with production levels expected to average up to 700 BOPD and 120 barrels of water per day (BWPD) in the first year, with oil production tapering off to approximately 100 BOPD and water production increasing to 892 BWPD by year the final year of production. Production is projected to commence in 2008 and continue at least through 2020 and potentially beyond, depending upon production characteristics and project economics.

PRC 421 operations would share infrastructure used by other Ellwood area operations as described in Table 2-1. Figure 2-3 shows the location of these facilities.

2.2.3 Project Components

The proposed Project comprises implementation of a number of improvements to existing Ellwood area facilities (Figure 2-3). Major Project components include repairs and equipment installation on Piers 421-1 and 421-2 and the installation of a new oil flowline and electrical cables. Currently, both PRC 421 wells are shut-in and equipped with subsurface safety valves and packers.

Pier 421-1

Utilizing existing injection equipment, Well 421-1 would be returned to service as a water and gas injection well and would be utilized to reinject and dispose of water and gas that had been separated from the gross fluid produced out of Well 421-2. In order to return the well to service, a flow safety valve (FSV) would need to be installed as part of the wellhead piping to prevent reverse flow from the well. The new downhole pump in Well 421-2 would provide enough pressure to inject up to 1,000 BWPD into Well 421-1. New wood-plank decking would be installed for safety and aesthetic purposes. Because the seaward facing wall of the caisson of Pier 421-1 was repaired in February 2004 following storm damage, no additional improvements to the pier or caisson are proposed as part of this Project.

Major Project Components and Modified Existing Facilities

FIGURE 2-3

Table 2-1. Ellwood Area Oil Production Facilities

Ellwood Onshore Facility (EOF)	
Location/Size:	7979 Hollister Ave.; 0.5 miles northwest of PRC 421/4.5 acres
Role in Ellwood Area Production:	The EOF processes the oil emulsion received from offshore oil facilities (e.g., Platform Holly) using a crude-oil processing system to remove water and gas from the oil emulsion by pumping through filters and an emulsion/water heat exchanger. Gas is sweetened through removal of H_2S. Oil is transmitted to the EMT via Line 96 (see below) and treated gas is loaded into the regional delivery pipeline for sale.
Relationship to PRC 421:	The EOF would not be used to process oil produced from PRC 421, but would provide support facilities including a motor control panel and step-up transformer to supply power to PRC 421, instrumentation and well control devices for a remote alarm, real-time operational monitoring of safety systems for the Well 421-2, and emergency shutdown capability from the EOF Operator Interface Terminal.
Pipeline 96 (Line 96)	
Location/Size:	Extends from the EOF to the EMT/3.7 miles long
Role in Ellwood Area Production:	Line 96, owned by the Ellwood Pipeline Company and operated by Venoco, is a 10-inch pipeline that transports oil from the EOF to the EMT in batch shipments four to six times per day. A computational pipeline monitoring system is installed and operational for the pipeline. The pipeline remains in service and under pressure between batch shipments.
Relationship to PRC 421:	The oil stream from PRC 421 would be sent to Line 96 for distribution to the EMT and eventually to market. The connection to Line 96 would be at a valve box located on an easement granted to Venoco that lies just outside the southern limits of the EOF. At the Line 96 tie-in, a FSV would be provided to prevent backflow of oil from the pipeline.
Ellwood Marine Terminal (EMT)	
Location/Size:	Unincorporated Santa Barbara County, less than 1 mile west of Coal Oil Point, south and east of Goleta, approximately 500 feet from the shoreline bluff at an elevation of 60 feet above msl/17.5-acres
Role in Ellwood Area Production:	The EMT stores and transports all of the oil production from Platform Holly and the South Ellwood Field. At the EMT, oil is stored in two 65,000-barrel, riveted construction, internal-floating-roof crude oil storage tanks. From the storage tanks, oil is pumped through an approximately 2,500-foot-long loading line to an offshore marine loading connection for loading into the barge Jovalan.
Relationship to PRC 421:	Oil produced from PRC 421 would be transported to the EMT for subsequent loading to the barge Jovalan.
Barge Jovalan	
Location/Size:	2,500 feet offshore, south of EMT, when anchored/300 feet long, 68 feet wide, with a loaded draft of 18.5 feet; maximum capacity is 56,000 barrels
Role in Ellwood Area Production:	The barge Jovalan, which is the only barge permitted to transport oil from the EMT, is currently loaded approximately 25 times per year. However, under the EMT Lease Renewal Project, barge calls would gradually increase to a maximum of 88 annual barge trips. Barge-loading operations require approximately 24 hours for completion. The barge Jovalan, which is single-hulled, delivers the oil to refineries in the Los Angeles/Long Beach harbors and the San Francisco Bay Area.
Relationship to PRC 421:	The barge Jovalan would deliver PRC 421-produced oil commingled with oil produced from Platform Holly to refineries in the Los Angeles/Long Beach harbors and the San Francisco Bay Area.

Table 2-1. Ellwood Area Oil Production Facilities (continued)

Platform Holly	
Location/Size:	Offshore on State Lease PRC 3242, in the Santa Barbara Channel, approximately 1.9 miles southwest of Coal Oil Point, at a water depth of 211 feet/triple-decked drilling and production platform with 30 well slots
Role in Ellwood Area Production:	The platform produces oil and gas from offshore wells. Subsea pipelines transport oil/water emulsion and produced gas to the EOF for processing.
Relationship to PRC 421:	No process equipment would be installed aboard Platform Holly as part of PRC 421. Oil that is produced from Platform Holly would be commingled with oil from the proposed project in Line 96, sent to the EMT, and transported to refineries via Barge Jovalan.

Pier 421-2

Well 421-2 would be returned to service as an oil production well. For the well to function safely, a number of repairs and upgrades would need to be made, including repairs to the caisson wall, installation of separation equipment to separate oil from water and gas, and installation of a new submersible pump.

Caisson Repairs

The caisson of Pier 421-2 is proposed to undergo repairs, similar to the 2004 repairs to Pier 421-1, including:

- installation of a caisson support floor;
- installation of soldier piles and a pre-cast panel; and
- pouring of concrete slurry behind the new panel.

Well 421-2 Improvements

Well 421-2 would have a new downhole ESP installed. Additionally, a trio of stainless steel electrical equipment enclosures would be located at the wellhead: one to house the gross production meter; another to house the wellhead safety control panel (including high/low pressure pilots, hydraulic reservoir, and other necessary actuation equipment); and a third electrical box to house the utility power transformer and electronics associated with the metering and communication of safety signals. The meter box is expected to measure roughly 40 cubic feet in size, while the wellhead safety control panel and electrical panel are each expected to measure 36 cubic feet. The electrical panel would also house the electrical service receptacle, an auxiliary stop switch to be used by well servicing personnel, and would include a tamper switch to alert staff at the EOF of possible tampering (i.e., vandalism). A surveillance camera

would be mounted on Pier 421-2 to monitor the piers. The live video feed would be displayed in the EOF control room.

Installation of Gas-Liquid Cyclone Separator

A new Gas-Liquid Cyclone Separator (GLCS) would be installed at Pier 421-2 for the purpose of separating produced gas and water from oil. The last time Pier 421-2 produced in 2001 there was no detectable gas production. However, the GLCS is designed based on typical properties for California oils at this depth, which the gas-oil ratio is estimated to be 100 standard cubic feet per stock tank barrel (SCF/STB). The GLCS is a compact vertical vessel with a tangential nozzle located near the top that subjects incoming fluids to a hydraulically created vortex and centrifugal forces, causing the heavier liquid particles to separate and thus obtaining split liquid and gas streams, as detailed in Section 2.4.1, Operational Procedures.

Pipelines

Existing Pipeline Enhancement

An existing 6-inch outer-diameter pipeline currently connects PRC 421 to Line 96. The line extends from Pier 421-1 along a Venoco right-of-way (ROW) approximately 1,300 feet along the old seawall to a point just south of the 12th tee of the Sandpiper Golf Course, turns north into the Platform Holly pipeline ROW, and extends another 500 feet to the edge of the EOF (Figure 2-4). The pipeline connects to Line 96 at a valve box located on an easement granted to Venoco that lies just outside the limits of the EOF parcel, south of the heliport.

The current condition of the 6-inch pipeline is uncertain. The pipeline is wrapped and cathodically protected against external corrosion. The 6-inch pipeline leaked in 1994 (see Section 2.1.1, Project History). The leak was repaired and the pipeline was hydrotested. The pipeline has not been used since the 1994 shut-in. As part of the proposed project, the existing 6-inch pipeline would be hydrotested to 100 pounds per square inch (psi) and internally lined with a new plastic coating. The 6-inch pipe would be protected against external corrosion by enhancing the impressed current cathodic protection system on the Platform Holly pipelines to include the PRC 421 6-inch shipping line.

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Project Components

FIGURE 2-4

Proposed Pipelines

After the upgrades to the 6-inch pipeline preparation are complete, a new 2-inch flowline would be inserted inside the existing 6-inch pipeline to transport oil to Line 96. Additionally, a double-walled flowline would replace an existing 2.5 inch flowline between Well 421-2 and Well 421-1. Two new 2-inch flowlines (one for water and gas, one for oil) would be installed inside the new double-walled flowline.

Electric Cables

Electricity would be provided to Pier 421-2 via two cables buried within a 30-inch-deep, 12-inch-wide, 2,500-foot-long trench located within the easement through Sandpiper Golf Course and down the dirt access road (Figure 2-4). The ESP at Well 421-2 would receive power through a buried and armored 200 kilo volt amperes (KVA), 1,100 volts of alternating current (VAC) power cable. In addition, a smaller 480 VAC cable would be installed to provide electrical power for metering, well instrumentation, and control systems. A utility power receptacle and an integral communication cable for data transfer would also be installed. The delivery voltage of the utility power would be 480 volts (V), and a small step-down transformer would be installed in the Well 421-2 electrical panel to drop the voltage down to 120V. The utility power outlet would be located inside of the power panel, and would be a heavy duty, 20 Amp, “Arktite” type of plug receptacle.

2.3 CONSTRUCTION PROCEDURES

Construction for the proposed Project is proposed to involve the following sequence of events – some of the tasks may occur concurrently.

1) Caisson repairs at Pier 421-2 including installation of a caisson support floor and seaward-facing wall

2) Installation of an electrical motor control panel, transformer, and power cable connections at the EOF;

3) Installation of an ESP with tubing, packer, and subsurface control equipment in Well 421-2;

4) Installation of a surface oil/water/gas separation, metering, and control equipment at the Well 421-2 wellhead;

5) Clean-up of the existing 6-inch pipeline;

6) Cut-out and removal of the two 90-degree bends within the existing 6-inch pipeline;

7) Insertion of one new 2-inch steel coiled flowline within the existing 6-inch pipeline between 421-1 and Line 96;

8) Restoration of the existing 6-inch pipeline at the area where 90-degree bends are removed;

9) Replacement of 2.5-inch flowline connecting Piers 421-2 and 421-1 with new double-walled piping and insertion of two new 2-inch steel coiled carrier flowlines within the new double-walled piping;

10) Trench excavation and installation of new power cables in the existing access road;

11) Testing of pipelines and equipment;

12) Flushing and abandonment of existing buried flowlines; and

13) Work site restoration and cleanup.

2.3.1 Construction Schedule

Construction activity is estimated to extend over 45 work days and be most noticeable during the periods of inserting the plastic liner and the new steel coiled tubing flowline within the existing 6-inch pipeline, burial of the power cable, and movement of the workover rig to and from Pier 421-2. Each one of these operations should be relatively brief, extending several days each. Burial of the new power cable under the access road through the golf course area is expected to take approximately one day. The downhole well work associated with Well 421-2 is expected to take a maximum of 15 work days.

2.3.2 Construction Staging Area and Equipment

During the construction phase of the Project, all construction equipment and materials would be staged in an existing easement area located immediately adjacent to the EOF west fence line. A 30-foot by 30-foot helipad at the south end of the EOF could also be used as an additional staging area for vehicles and materials should the need arise. The access road, in the area between Piers 421-1 and 421-2, would also be used for staging. Temporary construction fencing would be placed around the wetland located immediately north (bluff side) of the access road, near the entrance to Pier 421-2 to protect it from construction activities.

Equipment anticipated to be necessary for construction activities associated with the proposed Project is summarized in Table 2-2.

Table 2-2. Preliminary List of Construction Equipment for PRC 421

45-ton crane	Vacuum truck	Backhoe with loader
Auger-type drilling rig	1-ton tool truck	Ditcher/trencher
Semi truck	Pick-up truck	Generator
Pile driving equipment	Fuel truck	Camera Truck
Power pack	Water truck	Mud pump (trailer mounted)
Ready-mix cement pump truck	Jack hammer	Welding truck
Flatbed truck	Jet pump	10-ton winch (Grundo)
CAT 320 excavator	Air compressor	Fusion machine
CAT 950 loader	Concrete saw	Hydrotest pump
Dump truck	A-Frame truck	Well service/workover rig
Motor grader	Misc. carpentry, concrete, and welding equipment	X-Ray truck

2.3.3 Best Management Practices

Best Management Practices (BMPs) would be implemented throughout the construction phase of the proposed Project. As the proponent, Venoco would implement site-specific construction mitigation plans, including a traffic minimization plan and equipment refueling plan. A copy of proposed BMPs is located in Appendix F.

2.3.4 Construction Details

Pier 421-2

Construction activity at Pier 421-2 would consist of installing new production and separation technologies, including the ESP, the GLCS, pipeline improvements, and caisson repair work.

Caisson repair work would include the installation of a caisson support floor and of a new seaward-facing wall. The majority of the caisson repair work would be completed from the existing caisson and pier structure; however, some beach access would be required to prepare for the installation of the new wall face. Beach access would be provided via a temporary ramp near the west end of the access road (see Figure 2-4). In order to use the existing caisson as a platform for the pile driving and installation work, a support floor would be installed on top of the caisson to support necessary equipment. To construct the support floor, a 45-ton crane would be used to install approximately 20 pipe piles measuring 12 inches in diameter by 20 feet in length into and within the existing caisson. The same crane would be used to install steel beams and mats to construct the support floor.

Using the same crane, 15 steel soldier piles would be installed to support the new pre-cast concrete panel wall face. An auger type rig would drill 15, 2-foot diameter holes approximately 25 feet deep into the Monterey shale bedrock to receive the piles. A 2-foot diameter casing would be set for each hole to prevent sand from filling the hole and to contain the drill cuttings for recovery to the extent feasible. No drilling fluid would be used. The 2-foot diameter casing would be left in position to allow filling the hole with concrete and prevent sand from entering the hole. Concrete would be pumped to the bottom of the hole through a hose until the hole is completely filled. Water in the holes displaced by the concrete would be recovered by a pump system or vacuum truck to the extent feasible and properly disposed of offsite.

Following installation of the piles, and again using the same 45-ton crane, 56 pre-cast concrete panels approximately 5.5 feet wide, 5 feet high and 8 inches thick would be set between the steel soldier piles to form the new wall face. The base row of the concrete panels would be keyed into the underlying bedrock. An excavator placed on the beach would scrape the sand from between the piles and cut into the bedrock to key the concrete panels in the Monterey shale base. As the bottom panel of each section is being set, a sand jet unit (set on top of the caisson) would clear the sand, allowing the panel to sit directly on or near the Monterey shale base. Once the first set of panels are in place, a grout plug would be placed behind the panels, and other panels would be installed on top until the full wall height is achieved. The top panels would be trimmed as necessary.

Approximately 200 cubic yards of concrete slurry would be injected between the new concrete panel wall and the existing, older Pier 421-2 caisson wall to provide additional structural strength and solidify the structure.

Any sand remaining behind the new panel wall would be jetted out of the area to the extent practicable. Plastic sheeting in a “U” shape would be placed behind the panels and a plug of grout approximately 4 feet high would be poured. The plastic sheeting would serve to contain the grout and to prevent it from migrating through the face of the wall. After the slurry sets, the remaining concrete slurry would be poured and/or pumped into the space between the new wall and the old caisson wall.

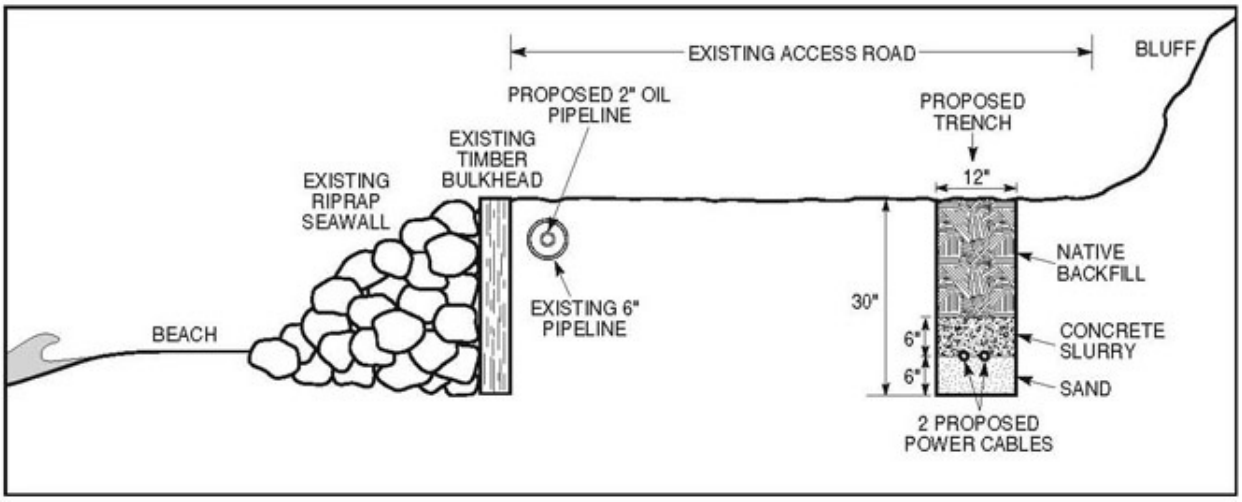
2.3.5 Oil and Produced Water and Gas Pipeline Installation

Overview

Two new 2-inch steel coiled carrier flowlines within new double-walled piping would be installed, replacing the existing 2.5-inch flowline between Pier 421-2 and Pier 421-1.

For oil going to Line 96, a new 2-inch steel coiled flowline and plastic liner would be installed within the existing 6-inch pipeline between Pier 421-1 and the tie-in at Line 96 (Figure 2-5). Insertion of the new plastic liner and the 2-inch line within the 6-inch pipeline would occur by placing winches and spooling units either at the intermediate block valve location or at either end of the pipeline. Any field cuts would be made above a portable containment basin with a vacuum truck present to capture any fluid and prevent contamination of the surrounding environment. No trenching would be required other than to expose the ends of the existing 6-inch pipeline and to open up an intermediate point to repair the exposed section of 6-inch pipe.

FIGURE 2-5. EXISTING ACCESS ROAD AND PROPOSED PIPELINE AND POWER CABLE CORRIDOR



Repairs to Existing 6-inch Pipeline

The internal pipe coating for the existing 6-inch pipeline would be applied using a process known as “fold and form” sliplining. During this process, a thin-wall, high density polyethylene (HDPE) liner is temporarily deformed, into a “heart” shape cross-section, which would then allow direct insertion into the existing 6-inch pipeline. After insertion, the pipe would be “inflated” back to its correct cross-section. The inflation process would be accomplished using low-pressure (less than 100 pounds per square inch gauge [psig]) air or water. In some cases, a heated media, such as hot water, may be used to aid in restoring the final shape of the liner.

Within the existing 6-inch pipeline, at a point close to the location of the 1994 leak after which production from Well 421-2 ceased, there is an exposed section with two 90-degree bends where the protective wrapping has been lost. A section of pipe, approximately 25 feet in length, would be cut out and replaced with new, wrapped

6-inch pipe. The section would also serve as an intermediate pulling point for both the 6-inch slipline and the internal 2-inch flowline.

A pulling winch would be located at this point and would pull the 6-inch "fold and form" liner from two insertion points. One insertion point would be located in the Pier 421 access roadway, and the other insertion point would be located adjacent to the existing Line 96 tie-in vault located just outside the EOF fence, alongside the access roadway. After the liner has been pulled through each of the two pipeline segments, it would be inflated to its final size and tested.

Installation of New 2-inch Pipeline

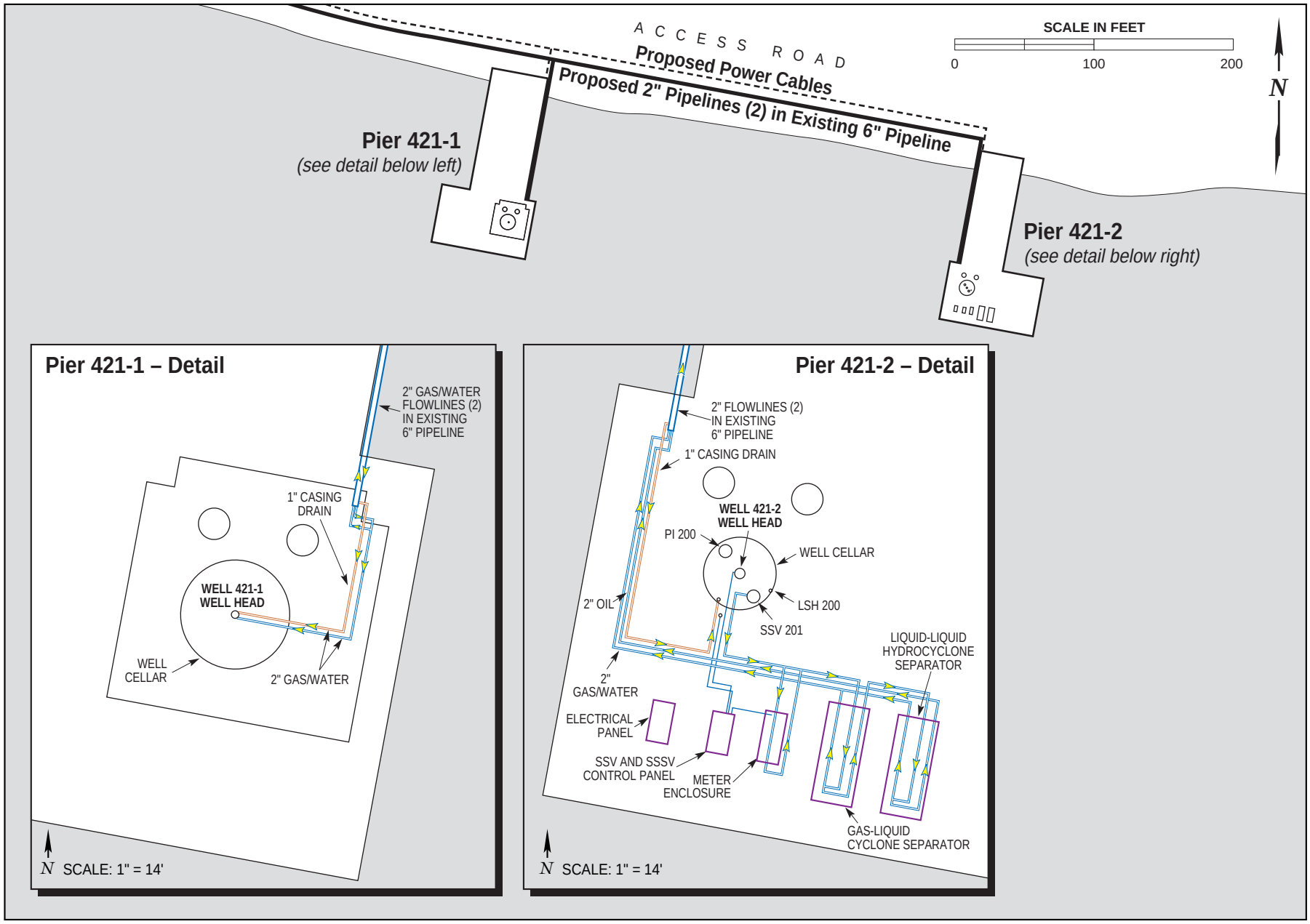
In a manner similar to the installation of the 6-inch "fold and form" liner, the 2-inch internal flowline would be pulled into the now-internally lined 6-inch pipeline. Following integrity testing of the newly installed liner, a pulling winch would again be located at the proposed pulling location. The 2-inch flowline would be pulled into the 6-inch pipeline from two directions; one insertion point would be located in the Pier 421 access roadway, and the other insertion point would be located adjacent to the existing Line 96 tie-in vault located just outside the EOF fence, alongside the access roadway. After the 2-inch flowline is pulled through each of the two pipeline segments, it would be pressure tested. Final assembly would include installation of annular casing end seals and anchors at the ends of the existing 6-inch pipeline.

The final tie-in would take place following successful integrity testing of the 2-inch flowline. Outside of the EOF, the flowline would be tied into the existing Line 96 pipeline. Near Pier 421-1, a produced water and gas line would be looped within containment to serve the 421-1 injection well. At Pier 421-2, both lines would be connected to the 421-2 production equipment (Figure 2-6).

Following installation of the 2-inch flowline, the discontinuous existing 6-inch containment piping at the pipe pulling location would be "clam shelled" back together again, thus providing continuous 100-percent containment. The pipeline system would again be pressure tested to verify containment piping integrity.

2.3.6 Installation of Electrical Cables

The proposed new electrical cables to be buried in a trench would require a minimum burial depth of 24 inches beneath the existing access road, within a 2,500-foot long, 1-foot wide, and 30-inch deep trench, which would be excavated as part of this Project. The trench would be designated with power cable markers along the route. The cable



Proposed Project Components at Piers 421-1 and 421-2

FIGURE 2-6

route would be surveyed and staked within the access road ROW. Six inches of sand bedding would be placed into the bottom of the ditch and the two power cables would be placed into the ditch on top of the sand, after which the ditch would be backfilled with a concrete slurry mixture to a minimum depth of 6 inches over the cables. The slurry is used to provide additional protection to the buried cables and provides "early warning" to future parties who may be digging along this route. The remainder of the ditch would be filled using materials excavated from the site, and the surface would be restored (Figure 2-5). The estimated area of disturbance associated with cable excavation is 6,250 square feet. Additional excavation would be required to affect repairs to the existing 6-inch pipeline at the 12th green at Sandpiper Golf Course, and to expose piping between Piers 421-1 and 421-2.

2.4 OPERATION, MAINTENANCE, AND SAFETY CONTROLS

2.4.1 Operational Procedures

Operational Overview

Production from Well 421-2 would initially be routed into a GLCS located on the northeast corner of the 421-2 caisson. The GLCS would separate gas from the oil and water using cyclonic technology. The oil and water would then enter a hydrocyclone separator, which would be located on the same skid next to the GLCS, and would separate water from oil particles into a central collection tube. The respective oil and water streams would be metered, the oil stream would be sent to Line 96 for sales, and the water would be commingled with the produced gas and sent through the second 2-inch flowline to Well 421-1 for reinjection. No water injection pumps would be installed at Well 421-1; the downhole pump in Well 421-2 would supply enough system pressure (200 psi) to inject up to 1,000 BWPD in Well 421-1. This would be sufficient to dispose of the Project's produced water and gas.

2.4.2 Transportation

The proposed transportation of oil produced from PRC 421 is projected to evolve over the approximate 12 year life of the project and would be affected by several factors. Initially, the proposed Project would rely upon the existing transportation system, utilizing the EMT and barge Jovalan to transport oil to refineries. However, after the first several years of Project operation, transportation methods would change from utilizing the EMT and barge Jovalan to either a pipeline or trucking. The factors which would affect selection of transport modes and the possible timeline for change in transport modes are discussed below.

Initially, during the first 5 years of operation, oil produced from PRC 421 would be piped to Line 96 where it would be commingled with EOF-processed oil from Platform Holly and delivered to Venoco's markets by the barge Jovalan, which is the current method of transporting oil produced from the Platform Holly.

The barge Jovalan is loaded with crude oil from the storage tanks in the EMT. The barge is currently loaded approximately 25 times per year; the loading operation is completed in 13 to 17 hours (Minerals Management Service [MMS] 2000). Currently, the barge Jovalan delivers crude oil to Venoco's market facilities in Los Angeles/Long Beach harbors and the San Francisco Bay area.

The barge Jovalan follows prescribed transit routes for the West Coast of the U.S. The barge is towed behind a tug connected by a 2-inch wire rope and a bridle chain at a distance of approximately 1,000 feet. Vessel traffic lanes have been established for north, south, and west entrance approaches to San Francisco and Long Beach harbors, as well as at the EMT in Santa Barbara County. Figure 2-7 shows the oil service vessel corridors for Platform Holly and the EMT. Each approach consists of an inbound lane, and outbound lane, and separation zone. A precautionary area is also established where traffic is merged. Once inside the precautionary area, vessels use the U.S. Coast Guard (USCG) Vessel Traffic Service established in the various ports and adhere to the specific traffic lanes on established charts for each port (Figure 2-8).

FIGURE 2-7. OIL SERVICE VESSEL ROUTES IN THE ELLWOOD AREA

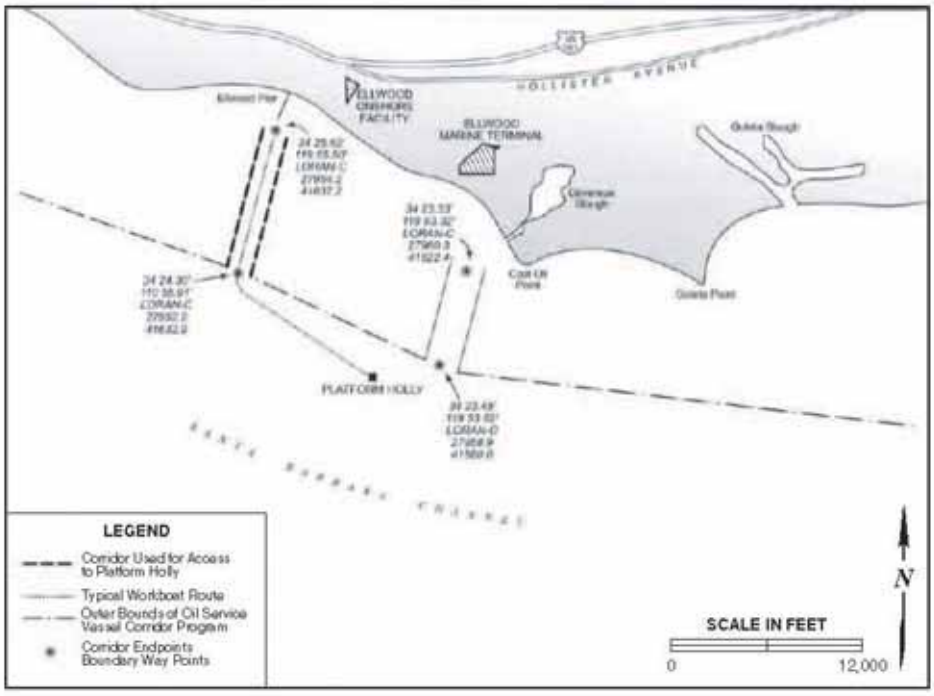
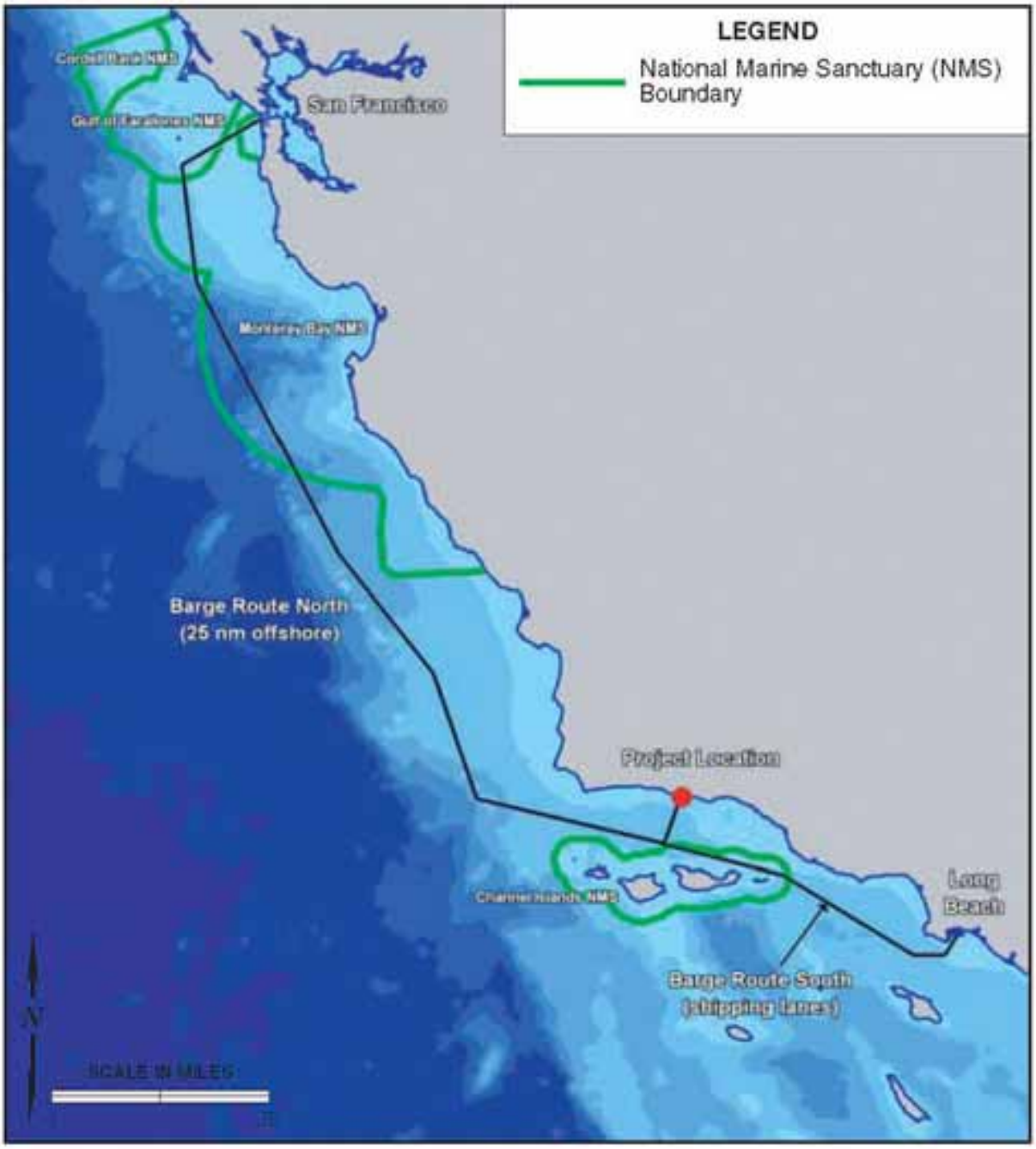


FIGURE 2-8. ROUTES TO SAN FRANCISCO AND LOS ANGELES



The current operation of the offshore area of the EMT and oil transportation using barge Jovalan is in holdover status and pending lease renewal from the CSLC (CSLC 2006a). If approved by the CSLC, the new lease and terms would be for a 10-year period beginning February 28, 2003 (time of previous lease term), and ending February 28, 2013. The final EIR and CSLC decision on the lease renewal is anticipated in summer 2007.

The operation of the onshore area of the EMT is leased to Venoco from the University of California, Santa Barbara (UCSB) and is set to terminate on January 1, 2016 at the latest, or sooner if another oil transportation mode, such as a pipeline, becomes operational. Based on the UCSB Long Range Development Plan (LRDP) amendment approved by the CCC in November 2006, the onshore lease with Venoco for oil transportation would appear unlikely to be renewed or extended beyond 2016 and the EMT facilities would be required to be removed and cleaned up and the area restored to a natural condition consistent with provision of the lease and the site's planned open space use.

The oil transportation future of the Project beyond the expiration of the EMT lease is uncertain. Assuming that the EMT lease renewal is granted by CSLC, the lease would expire February 28, 2013. If CSLC does not issue a new lease renewal at that time, the EMT and barge Jovalan would no longer be available for the transportation of oil. The UCSB lease for the EMT is set to terminate on January 1, 2016. According to the provisions of Venoco's lease with UCSB, EMT facilities should be abandoned and the property should be cleaned up by this time. So even if CSLC extends the EMT lease beyond 2013, the EMT and barge Jovalan is not likely to be available after December 31, 2015 at the very latest.

Venoco has submitted an EOF trucking contingency plan application to the city of Goleta to allow for short-term (90 days or less, per event) trucking of crude oil in case the barge Jovalan is temporarily out of service (i.e., for repairs). This would entail modifications to the existing truck loading rack at the EOF currently utilized for trucking of natural gas liquids (NGL) and liquefied petroleum gas (LPG) to accommodate loading of crude oil. Venoco does not currently intend to utilize the permit (pending city of Goleta approval) to truck the oil, but wants the permit in place so they can be ready to temporarily truck crude oil as a contingency plan if the barge Jovalan is out of service. However, such trucking facilities would also provide the equipment required to use trucking transportation service in case the CSLC does not extend the EMT lease, or upon potential cessation of that lease in 2013. Permanent trucking of either PRC 421 or Platform Holly crude oil would require additional permitting and approval by the city of Goleta. Should Venoco desire to utilize and obtain permits for a trucking option after cessation of marine transport in 2013, it is estimated that approximately two tanker trucks per day would be required in the early years of truck transport, declining to one truck per day toward the end of the Project's estimated productive life (approximately 2020). Oil produced at PRC 421 would be trucked 35 miles south to the Rincon Onshore Separation Facility (ROSF), just east of Carpinteria. There, the oil would be commingled with oil from the ROSF and transported

by pipeline south to Los Angeles. Section 3.3.6, Transportation Sub-Alternative Options, provides a more detailed description of potential trucking operations.

Venoco also has a pending application with the CSLC to construct a pipeline as part of the Ellwood Oil Development and Pipeline Project (Full Field Development). Components of the Full Field Development project include extending the offshore lease boundaries of PRC 3120.1 and PRC 3242.1 from Platform Holly, installing an onshore pipeline from the EOF to Las Flores Canyon, and decommissioning the EMT (see Sections 1.2.4, Related Ellwood Area Oil Projects, and 3.3.6, Transportation Sub-Alternative Options, for more detail). This project is currently under study and an EIR is in preparation that is anticipated for agency and public review in the summer of 2007. A decision on this project is anticipated in 2008 and if approved a new pipeline would be constructed and operational in 2009-2010 at which time, oil from PRC 421 would continue to be commingled with oil from Platform Holly at the tie-in of the portion of Line 96 that would remain a part of the new pipeline system and flow to Las Flores Canyon until the end of PRC 421's production life.

If the decision is not to approve the Full Field Development project or renew the EMT beyond 2013 (CSLC) or 2016 (UCSB), production from PRC 421 could be stranded, at least temporarily, until an alternative transportation mode is approved and becomes available.

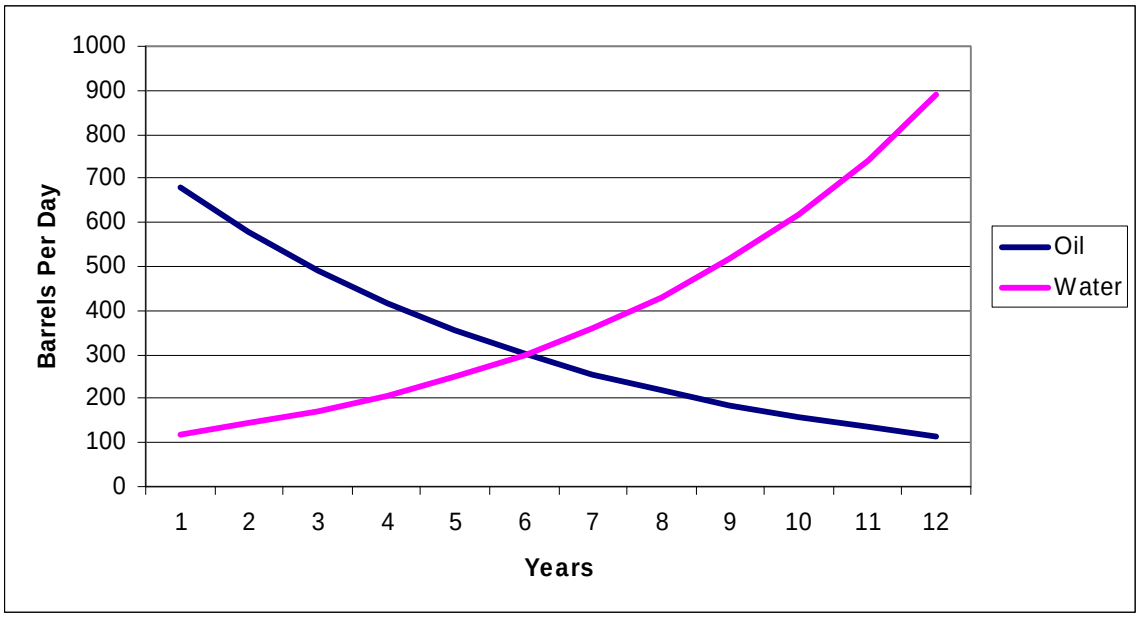
2.4.3 Volumes and Throughput

Production from PRC 421

Venoco has estimated that based on current projections, the productive life of Well 421-2 would be approximately 12 years. It is expected that water breakthrough would occur shortly after the start of continuous production. The water cut is expected to increase over the course of the production life of the well until it would no longer be economically viable to produce. The gas production rate should not exceed 70,000 cubic feet per day. The gas production rate was too small to measure during recent 421-2 tests.

Figure 2-9 shows that production is expected to average no more than 700 BOPD in the first year and taper off to approximately 100 BOPD by the last year of production, at which point, Venoco has estimated that disposal of large amounts of produced water will make the Project economically infeasible. However, the price of oil may dictate that the Project would continue to be economically feasible beyond the Applicant's expectation. It is also noted that, during the final years of previous production from PRC 421–in the late

FIGURE 2-9. PROJECTED AVERAGE PRODUCTION FROM PRC 421



1980s/early 1990s–the average production rate was between 50 and 60 BOPD. Therefore, while Venoco has proposed that this Project would have a productive life of approximately 12 years, historic data suggests that production could potentially continue beyond that time.

EMT Throughput and Capacity

The EMT has a permitted throughput of 13,000 BOPD, which is based on APCD limitations. The EOF and barge Jovalan have the same throughput limits according to permits issued by the APCD. Table 2-3 shows the annual throughput summary for the EMT for seven years (1998 through 2004). The proposed Project would contribute a maximum of 700 BOPD to the EMT in the first year and is expected to taper off as shown in Figure 2-9.

Barge Jovalan Throughput and Capacity

The barge Jovalan has a capacity of 56,000 barrels per load, hauls an average load of 52,777 barrels, and currently averages 2 loads per month totaling approximately 25 loads per year. The number of barge calls at the EMT would increase as a result of implementation of the proposed Project. The Project would increase the number of barge calls by up to 20 percent in the first year of operation, tapering down to a minimal contribution toward the end of operation. Five additional barge trips are expected to be needed in the first year, tapering off to two additional trips in year 6 (Table 2-4).

Table 2-3. EMT Throughput Summary

Year	Terminal Deliveries (barrels)	Terminal Barge Calls	BOPD
1998	1,264,160	24	3,463
1999	1,389,550	27	3,807
2000	1,319,545	26	3,617
2001	1,202,420	23	3,294
2002	1,301,142	24	3,565
2003	1,240,343	23	3,398
2004	1,190,925	22	3,263
2005	1,101,703	24	3,018

Source: CSLC 2006a.

Table 2-4. Expected Additional Barge Trips Generated by Proposed Project

Year	Additional Barge Trips
1	5
2	4
3	4
4	3
5	3
6*	2

*Venoco's renewed CSLC lease would expire in 2013.

2.4.4 PRC 421 Maintenance and Safety Systems

The proposed Project includes many levels of equipment requirements, testing, maintenance, and safety measures in order to prevent accidental releases to the coastal environment. The main safety monitoring system for PRC 421 would be located at the EOF and would include monitors at Wells 421-1 and 421-2. In addition to the monitoring system, additional safety measures are included in all aspects of the Project from pipelines to the drilling rig.

Remote Monitoring System for PRC 421

Production activities at PRC 421 would be monitored from the EOF via the motor control panel at the EOF using the existing EOF Remote Monitoring System (RMS), via a new, dedicated, Modbus Plus Based, cable link. A program logic controller (PLC) installed in the Motor Controller would collect both wellhead and separator data from Pier 421-2 and downhole performance data from the ESP. The status of Well 421-1 would be monitored by controlling the pressures and rates on the injection line running from Well 421-2. All of the operational systems and safety systems for Well 421-2 would be provided with a real-time monitoring capability at the RMS Operator Interface Terminals (OIT) located in the EOF control room. Monitoring data would include tubing and casing

pressures, motor load, operating frequency, motor temperature, intake temperature, intake and discharge pressures, separator temperature, pressure, and liquid levels, surface oil, and water and gas production. Local Alarms and Shutdown Safeties for each well would be displayed at the RMS. Both wells would have the capability of being shut down remotely from the RMS and OIT and by the EOF Emergency Shutdown.

Well 421-2

Safety Valves

The wellhead would be equipped with current safety equipment and follow safety design criteria as specified in API RP 14C, *Safety Analysis Function Evaluation (SAFE) of Offshore Petroleum Production Systems*. These standards would provide, at a minimum, for the installation of a sub-surface safety valve (SSSV) and surface safety valve (SSV) on the well. The oil discharge line would be equipped with high- and low-pressure sensing switches. In the event that these switches report high or low pressure, or in the event that any alarm forces a shutdown of the well, then the SSV and SSSV would automatically close and prevent oil from being brought to the surface. To assure fail-safe operation, these valves would be designed to normally close in the absence of any power or energy to hold them open. The SSV would use a charge of nitrogen or hydraulic fluid to hold it open, and the SSSV would depend upon a hydraulic fluid source to hold it open. In the event of a shutdown scenario requiring closure of the SSV and SSSV valves, a solenoid would release a small amount of nitrogen pressure or hydraulic fluid to a storage tank and the valves would spring closed. A small pump would be provided to allow re-energization of the SSV and the SSSV valves when a well is restarted after a shutdown. The selection of the SSV and SSSV well actuators has been made to maintain a very low surface profile.

At the Line 96 tie-in, an FSV would prevent backflow of oil from the pipeline, thus providing protection against uncontrolled oil flow from Line 96 to PRC 421.

Surveillance at Piers

A surveillance camera would be mounted on Pier 421-2 to monitor the condition and activity at the piers. The live video feed will be displayed in the EOF control room. The electrical panel would also house a tamper switch to alert staff at the EOF of possible tampering.

Downhole Pump Monitoring

The downhole ESP pump would be equipped with a multi-sensor to monitor downhole conditions such as motor load, motor temperature, intake temperature, intake and discharge pressures, and pump vibration. These data would be transmitted over the power feed back to the motor control panel located at the EOF. The motor control panel will incorporate safety switches to automatically shut-in the pump in the event of a deviation from normal operating conditions such as a pipeline rupture or a process interrupt.

Pipelines

Safety Measures for Existing 6-inch Pipeline

The existing 6-inch pipeline would be hydrotested to 100 psi and internally coated with a new plastic coating. It is not feasible to smart pig the existing 6-inch line as it contains pipe geometry that is incompatible with current pig technology. It cannot be determined at this time whether or not the line can be made piggable as the pressure containing integrity of the line must be established in order to be able to push a pig. In addition, the maximum bend radius and the distance between bends must be accurately known, which would require the use of pipeline geometry tools or excavation to verify the shape of certain underground sections. The 6-inch pipe would be protected against external corrosion by enhancing the impressed current cathodic protection system on the Platform Holly pipelines to include the PRC 421 shipping line. At a minimum, the pipeline would hold the indicated test pressure for a period no less than 8 hours. Hydrotest water would be provided by the Goleta Water District connection located at the EOF and drained back to the EOF when hydrotesting is finished. The returned hydrotest water would be introduced into the oil processing system for treatment and disposal. A leak detection sensor would be provided within the 6-inch pipeline, which provides the annular space of the double-wall piping system to provide indication and automatic shutdown in the event of a leak. In the event of a leak, the ESP well would be automatically shut-in and an alarm would sound at the EOF.

Safety Measures for Proposed 2-inch Flowline

The 2-inch flowline would be constructed of steel coil tubing and the tubing would be purpose-designed and built for insertion service. The coil tubing would be high-strength steel with a minimum yield strength of 52,000 psi. The flowline would also be coated for corrosion protection, and to help reduce abrasion during the pipe pulling installation.

The coating to be used would be either a factory applied Fusion Bonded Epoxy (FBE) system or an extruded polyethylene wrap system.

In the event of a 2-inch line leak, oil would be contained by the outer 6-inch pipe. Leak detection would be provided by routing fluid in the outer containment casing annulus directly into both well cellars. Fluid entering the well cellar would trip a high-liquid level alarm. Upon detection of liquid in the containment casing, or low pressure in the oil pipeline, the well pump would be shut-in and the SSSV and SSV would close. It is expected that a complete shut-in would occur within 15 seconds of leak detection.

Double-wall piping would also be used for the exposed sections of the flowlines installed on the pier causeway. The primary carrier pipe on the pier causeway would also be protected by an outer containment pipe. This outer containment pipe would be monitored by the same monitoring system that monitors the 6-inch containment piping onshore. The caissons of 421-1 and 421-2 would help contain potential leaks from the wellhead piping. Each well would also be equipped with a level switch to detect and provide an alarm regarding the build-up of liquids in the caissons.

Electricity Cables

For security reasons, the motor control panel and transformer would be located at the EOF rather than at Pier 421-2, where they can be more closely monitored.

Inspection Programs

Visual inspections are conducted at the PRC 421 facilities, including the piers, caissons, and roads, twice each day by EOF staff. Inspectors record any deficiencies and report them to Venoco management. Records of inspections are maintained in a log book at the EOF.

Facility inspections are performed by several agencies, including the CSLC, the APCD, the USCG, the Santa Barbara County Fire Department, Santa Barbara County Office of Emergency Services (OES), and the Santa Barbara County Planning and Development Department. The Marine Facilities Division of the CSLC has jurisdiction over terminal operations. The USCG has joint jurisdiction with the CSLC on the EMT Loading Line. The State Fire Marshal, city of Goleta, and Santa Barbara County share jurisdiction of Line 96, the supply oil pipeline from the EOF.

The Marine Facilities Division of the CSLC, the Santa Barbara County OES, and the APCD conduct annual inspections of the facilities, including oversight of the VRU system aboard the barge. Local agencies conduct an annual inspection at the EOF and

EMT per the facilities' Safety, Inspection, Maintenance, and Quality Assurance Program.

The vessels, tanks, and lines for the EMT are inspected by certified inspectors in accordance with American Petroleum Institute Recommended Practice API 510, 653, and 570. In addition, the tank primary and secondary floating-roof seals are inspected annually pursuant to APCD guidelines. Venoco also conducts internal safety walkthroughs on a monthly basis.

Security Program

Piers 421-1 and 421-2 prohibit entry via an 8-foot chain-link fence that blocks entry to the production equipment on the piers. The facility gate is kept closed and locked unless access is required. Security is provided to PRC 421 from Venoco staff at the EOF and is patrolled by a private security firm twice daily at irregular intervals.

Oil Spill Response Capability

Venoco's South Ellwood Field Emergency Action Plan (EAP) would cover the proposed Project (Venoco 1998). The EAP includes a facility-based initial incident response team (IIRT) and a corporate-based sustained incident response team (SIRT) for all on-water, beachfront, onshore, and shallow-water response. The EAP also details response procedures as well as training and drills for the covered facilities, in addition to the spill response capabilities. The California Department of Fish and Game (CDFG) Office of Spill Prevention and Response (OSPR), the Santa Barbara County Fire Department, and the Santa Barbara County OES approve the EAP.

Venoco contracts for spill response services with Clean Seas and Advanced Cleanup Technologies Inc. (ACTI).

Emergency Response Equipment

Initial response containment equipment for PRC 421 is stored onboard the barge Jovalan and Platform Holly. Procedures for deploying the oil-containment boom from the barge and the equipment available to respond to an oil spill are detailed in the EAP. Further, in the event of a spill, Clean Seas has an extensive inventory of spill containment and recovery equipment, response vessels, equipment trailers, vehicles, sorbents, and miscellaneous support equipment.

<u>Vessels</u>

Vessels available for emergency response at the Project site include:

- Platform Holly crew boat stationed at the Ellwood Pier and staffed 24 hours a day;
- Platform Holly Boston Whaler stationed at Platform Holly and staffed 24 hours a day;
- Clean Seas Oil Spill Response Vessel (OSRV), *Mr. Clean,* stationed at the Santa Barbara Harbor; and
- Clean Seas Fast Response Spill Boat (FRSB), *Clean Sweep,* stationed at the Santa Barbara Harbor.

Skimmers

The Clean Seas OSRV has three open ocean skimmers on board at all times, ready for service.

Oil-Containment Booms

Oil-containment booms available to assist in any emergency response situations include:

- 1,500 feet of heavy duty boom (i.e., 70-inch Expandi Boom or Kepner 24-inch High Seas Boom); and
- 3,000 feet open ocean boom (i.e., oil stop continuously inflatable and/or 43-inch Expandi Boom with Roto Pak recovery system).

Tertiary Response (Advanced Cleanup Technologies, Inc.)

ACTI is Venoco's primary contractor for onshore and shoreline cleanup. ACTI also provides secondary response to Clean Seas for offshore spill response equipment. ACTI has sufficient resources and trained personnel to satisfy all Federal and State onshore and shoreline cleanup planning requirements. A summary of equipment at various locations is provided below:

- Baker tanks, 500 barrels each;
- Vacuum trucks, 70 to 120 barrels each;
- Skimmers;
- River and canal/inland boom;
- Offshore boom; and
- Barges (105,210 barrels total capacity).

Clean Seas and ACTI have arrangements with Clean Coastal Waters, based in Long Beach, California, and Clean Bay, based in Concord, California, which can provide numerous cascadable resources. The cascadable response equipment would be readily available to assist in spills outside of their Areas of Response and is included in Venoco's response plans by reference.

The U.S. Navy Supervisor of Salvage (SUPSALV) provides full-service response capability. SUPSALV maintains an inventory of oil spill response equipment in Port Hueneme, California, which is deployed and operated by trained contract personnel. This equipment would be activated through the USCG On-Scene Coordinator.

Fire Prevention and Preparedness Plan

Venoco's Fire Prevention and Preparedness Plan for the South Ellwood Field Facilities identifies the measures that would be implemented and maintained in the event of a fire or emergency (Venoco 2003b). Venoco personnel utilize the resources cited in this plan to implement safe and effective response actions prescribed by this plan in conjunction with the South Ellwood Field EAP, which includes the Oil Spill Contingency Plan (OSCP) for the South Ellwood Field, Emergency Evacuation Plans, and hydrogen sulfide (H_2S) Contingency Plans. The Fire Prevention and Preparedness Plan, when supplemented by the South Ellwood Field EAP, fulfills Occupational Safety and Health Administration (OSHA) requirements for a Fire Prevention Plan as cited in 29 Code of Federal Regulations (CFR) 1910.38(b).

2.5 FUTURE PLANS AND ABANDONMENT

Venoco is required by lease to decommission all facilities associated with PRC 421 at the end of its lease term, whether or not this proposal is approved. Decommissioning activities of PRC 421 would generally include removal of Piers 421-1 and 421-2 and all of the facilities associated with PRC 421 including wells, production equipment, the ESP, and electrical equipment. Decommissioning of the Project would also likely involve removal of the seawall, beachside access road, pipelines and power cables within the access road, abandonment in place of the 1800 feet of 6-inch pipeline connecting PRC 421 to the EOF, and removal of the transformer and electrical lines connecting PRC 421 to the EOF. Site cleanup including soil remediation would also be required as several hydrocarbon leaks occurred in 1994, 2000, and 2001, and hydrocarbon contamination has been identified at the pier approach area of 421-2.

The decommissioning process would be subject to appropriate local, State, and Federal regulations that are in effect at the time of abandonment, and specifics on

decommissioning and hazardous materials investigations would be addressed in an Abandonment and Restoration Plan submitted to the CSLC and the city of Goleta and would require applicable environmental documentation such as a Negative Declaration or EIR. As required by Federal and State laws, Venoco would be responsible for cleanup and remediation of any potential contamination that could have resulted from the operation of PRC 421. Phase I and Phase II hazardous material site investigations would be required prior to sediment removal.